CDS olutions

APPLICATIONS INFORMATION USING ADVANCED SAMPLE HANDLING TECHNOLOGY

Orange Juice - Fresh and from Concentrate

Aroma compounds from foods may include esters, alcohols, aldehydes, ketones, and in the case of many citrus fruits, terpenes like limonene and pinene. The relative abundance of these volatile compounds differentiate one citrus fruit from another, and may provide information about different varieties, brands, quality, handling and processing of fruits and juices.

To compare the volatiles present in fresh orange juice to juice reconstituted from concentrate, two bottles of the same brand of juice were obtained, one labeled as from concentrate and the other as fresh. Since the volatiles are present at relatively large concentrations, only five drops of each juice was needed for the analysis. The samples were placed into the test-tube desorber option of the CDS Model 5200 Pyroprobe, operated in the trapping mode. Purge gas was delivered just above the surface of the juice while the desorber was heated to 40°C. Each sample was purged with helium for 10 minutes with the analytes collected onto a Tenax trap. The trap was then thermally desorbed to the GC at the beginning of the run.

Figure 1 shows the profile of volatiles collected from the sample of fresh juice. Several peaks have been identified, including a-pinene, ß-myrcene, and of course, limonene and are listed in Table 1 on the back. The volatiles from the "from concentrate" juice are shown in Figure 2. Although the overall profile of the two samples are similar, several differences are evident, including the relative amounts of esters such as peak number 11, linalyl propionate.

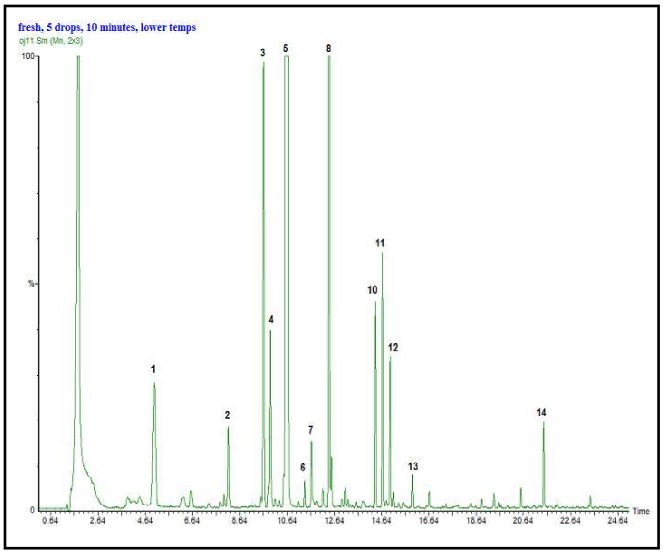

Figure 1. Volatiles from fresh orange juice.

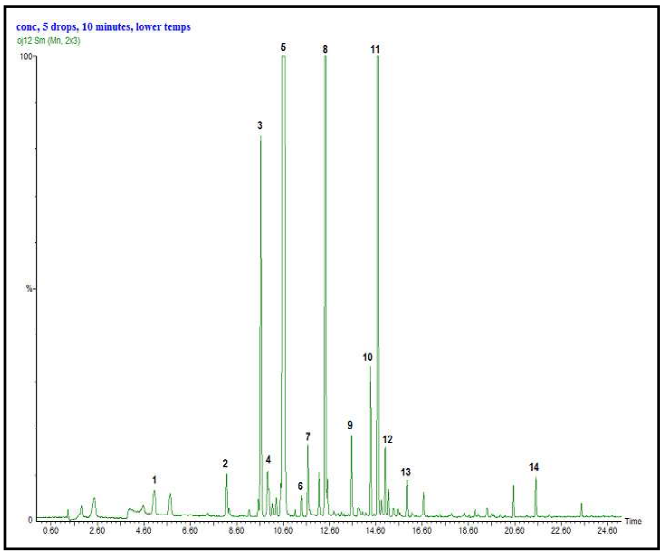

Figure 2. Volatiles from orange juice from concentrate.

TABLE 1

1. BUTANOIC ACID, ETHYL ESTER
2. ALPHA.-PINENE
3. BETA.-MYRCENE
4. OCTANAL
5. DL-LIMONENE
6. GAMMA.-TERPINENE
7. 1-OCTANOL
8. LINALOOL
9. BETA-TERPINEOL
10. 4-TERPINEOL
11. LINALYL PROPIONATE
12. DECANAL
13. 2-CYCLOHEXEN-1-ONE, 2-METHYL-5-(1-METHYLETHENYL)-
14. VALENCENE

Equipment

These samples were analyzed using a CDS Model 5200 Pyroprobe, interfaced to a Clarus 500 gas chromatograph/mass spectrometer.

Model 5200 Conditions

Valve Oven:	300°C
Transfer Line:	325°C
Temperature:	40°
Time:	10 minutes
Trap:	Tenax
Trap Desorb:	300°C for 4 minutes

GC Conditions

Carrier:	Helium
Column:	Rxi-5ms (30m X 0.25mm)
Detector:	Clarus 500 MS

GC Program:

Initial:	40°C for 2 minutes
Ramp:	10°C/min.
Final:	300°C

FOR MORE INFORMATION CONCERNING THIS APPLICATION, WE RECOMMEND THE FOLLOWING READING:

Techniques for Analyzing Food Aroma, R. Marsili, Ed., Marcel Dekker, New York.

Additional literature on this and related applications may be obtained by contacting your local CDS Analytical representative, or directly from CDS at the address below.

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